## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

### MEMORANDUM

DATE:

November 11, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, North Beach, November 9, 2011," for your review. Please refer any comments you may have on the document to me by January 11, 2012. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

## SITE: NORTH BEACH

Report Date: November 11, 2011 Prepared by: Mike S. Horn

### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at North Beach was audited on November 9, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

### 2.0 Parameters Audited:

#### T.E.O.M. PM-10

### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

## Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	11/11/11					
Date:	11/9/11			Site name: 1	North Beach	
Start:	14:30hrs. PS	ST		Operator: S	Scott Weaver	
Finish:	14:50hrs. PS	SΤ		Project: 9	SB 270	
Audited By:	Mike Horn			Site Elevation:	3600	ft.
Witness:	Scott Weaver			Amb. Pres.:	904.00	hPa
				Amb. Temp.:	15.9	deg. C
Prop. or Serial No.:	24983			Make:	R & P	
Type:	PM-10			Model:	1400ab	
				Last cal. date:	9/27/11	
	AUD	IT DEVICE(S)				
Make:	BGI Incorporated			Make: I	3GI Incorporated	
Model:	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lp	m		Range:	2 - 20	lpm
	Calibration Factors				Calibration Factor	's
Slope:	1.00			Slope:	1.00	•
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.090	0.140	15.4	-0.5	900.56	-3.4
Dark current:	N/A	N/A				
(	Qa=[dPxTa/Pa] <sup>1/2</sup> +b	)	Site		Nominal	Flow Rates
Audit	Audit Flow	v Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	17.05	17.05	16.64	-2.4	15.0	18.4
Bypass/Aux Flow Rate	13.92	13.92	13.65	-1.9		
Main Flow Rate	3.09	3.09	2.99	-3.2	2.7	3.3
<b>Total Flow Rate</b>	17.07	17.07	16.64	-2.5	15.0	18.4

Comments: None.

### TABLE A-1

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measuremen	nt Variable	Evaluation Criteria
Wind Speed		At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws $>$ 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input $\pm$ 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input $\pm$ 0.5° C Gravimetry Lab $\pm$ 1.0 deg. C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	ı	input ± 10%
Barometric l	Pressure	Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury
PM-10: Hi-V PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

## Appendix B

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

### AUDIT DEVICE

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CU10, HS10	8/30/11	N/A	N/A
Psychro-Dyne Psychrometer:	RH 04	N/A	1	1 0
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

			asin Unified Ai Element Oscill			FOR MORELHAN	
		porou		W AUDIT	dance (TEOM)	********	ST FREE CV
		Т	T	T AUDIT	1		т
						1	<del> </del>
Date:	11/9/0			Site Name	muth	Beach	
Start		PST		Operator		pleach	
Finish:	17. 11/	PST			: SB270	Weave	
	14.00	131		Site Elevation			ļ ļ
			+	Amb. Press.		ft	
				The second second second second second second	- / V / · V	in. Hg	1.
		-		Amb. Temp.	15.7	deg. C	
Drop Or Car No.	DIIGO						
Prop. Or Ser. No.:				Make:			
Type:	PM10				1400a, j		
			L L	ast Cal. Date:	9/27/11		
					1.1.		
		Audit	Device(s)				
Make:	BGI INCOR	PORAT	FD.	Make:	BGI INCOM	RPORATED	
Model:	DELTA CAL	- OIVIII	1	Model:	THE THEORY	THINHED_	
S/N:	0123 52	5		S/N:			
Range:	2 - 20	lpm		Range:	ULCO	Inm	
Calibration factors:	2 - 20	on the same of the	Calibr	ation factors:	2 - 20	ibiii	
Slope:	7 0		Canbi	Slope:	7 7		
Int.:	1.0			Int.:			
Cal Date:	0,0				0.0		
Vai Date.	45/0			Cal Date:			
	1/2						
$Q_a=m[c]$	IPxT <sub>*</sub> /P <sub>*</sub> ] <sup>1/2</sup> +b		Altitude Corre	ection Factor:	-1013		
Leak Check-Initial	Main:	.09	Aux:	. 14			
Leak Check-Final	Main:		Aux:				-
14630 - SI - 46 - 12140 - 12141 - 1214							
			Site		Nominal F	ow Rates	
Audit	Audit Flow	Rate	Flow Rate	Diff.		Upper Limit	
Point		(VLPM)	(VLPM),	(%)	(LPM)	(LPM)	
Total Fow Rate	1705		2.99 /13	65=16.6		18.4	
Aux. Flow Rate	12 95		12/6	0-1-10.6	7 10.0	10.9	
Main Flow Rate	3.09		17.69		0.7		
Total Flow Rate	3.07		27/11		2.7	3.3	
Total Tow Nate	17.07		16.69		15.0	18.4	
			Stand				
	Sampler		True	Raw			
A section			i	16 0			
Amb Temp	15.4			15.9			
Amb Temp Amb Press			900.56	964.0			
	15.4		900.56	964.0			
	15.4		900.56	964.0			
	15.4		906.56	964.0			
	15.4		906.56	964.0			
	15.4		906.56	964.0			
	15.4		906.56	964.0			
	15.4		906.56	964.0			
	15.4		906.56	964.0			
	15.4		906.56	964.0			
	15.4		906.56	964.0			
Amb Press	15.4		906.56	964.0			
	15.4		906.56	964.0			
Amb Press	15.4		906.56	964.0			
Amb Press	15.4		906.56	964.0			
Amb Press	15.4		908.56	964.0			
Amb Press	15.4		908.56	964.0			
Amb Press	15.4		908.56	964.0			
Amb Press	15.4		908.56	964.0			
Amb Press	15.4	2	908.56	964.0			

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

### MEMORANDUM

DATE:

July 7, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn ///

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, North Beach, July 7, 2011," for your review. Please refer any comments you may have on the document to me by September 7, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

# SITE: NORTH BEACH

Report Date: July 7, 2011 Prepared by: Mike S. Horn

### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at North Beach was audited on July 6, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

### 2.0 Parameters Audited:

T.E.O.M. PM-10

### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

## Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	7/7/11					
Date:	7/6/11			Site name: 1	North Beach	
Start:	13:40hrs. P	ST		Operator: 9	Scott Weaver	
Finish:	14:00hrs. P	ST		Project: S	SB 270	
Audited By:	Mike Horn			Site Elevation:	3600	ft.
Witness:	Scott Weaver			Amb. Pres.:	892.90	hPa
				Amb. Temp.:	29.4	deg. C
Prop. or Serial No.:	24983			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	6/9/11	
	AUD	OIT DEVICE(S)				
Make: 1	BGI Incorporated			Make: 1	BGI Incorporated	
Model: 1	DELTA CAL			Model: 1	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lp	om .		Range:	2 - 20	lpm
	Calibration Factors			( )=	Calibration Factor	rs
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.080	0.130	28.5	-0.9	890.43	-2.5
Dark current:	N/A	N/A				
(	Qa=[dPxTa/Pa] <sup>1/2</sup> +l	b	Site		Nomina	l Flow Rates
Audit	Audit Flor	w Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	17.39	17.39	16.64	-4.3	15.0	18.4
Bypass/Aux Flow Rate	14.18	14.18	13.65	-3.7		
Main Flow Rate	3.09	3.09	2.99	-3.2	2.7	3.3
<b>Total Flow Rate</b>	17.24	17.24	16.64	-3.5	15.0	18.4

Comments: None.

### TABLE A-1

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

	Measurement Variable	Evaluation Criteria
--	----------------------	---------------------

Wind Speed At  $ws \le 5 \text{ m/s}$ , input  $\pm 0.25 \text{ m/s}$ ;

At ws > 5 m/s, input  $\pm$  5% Starting threshold: 0.5 m/s;

R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H

Wind Direction input  $\pm 5^{\circ}$ 

Starting threshold: 0.5 m/s;

R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young

05103 Wind Monitor

Temperature input  $\pm 0.5^{\circ}$  C

input  $\pm$  2.0° C for PM-10, PM-2.5 samplers

Relative Humidity Ambient: input  $\pm$  5% RH,  $\pm$  1.5°C as dew point

Gravimetry Lab: input ± 5%

Precipitation input  $\pm 10\%$ 

Barometric Pressure Ambient: input  $\pm$  10 hPa

TEOM: ± 10 mm mercury

PM-10: Hi-Vol SSI, Partisol, BGI, input  $\pm$  10%; Design Flow  $\pm$  10%

PM-2.5 input  $\pm 4\%$ ; Design Flow  $\pm 5\%$ 

TEOM: Total Flow input  $\pm 10\%$ ; Design Flow  $\pm 10\%$ 

Main Flow input  $\pm$  10%; Design Flow  $\pm$  10% Bypass Flow input  $\pm$  10%; Design Flow  $\pm$  10%

TEOM: Leak Check Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

### Appendix B

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

### AUDIT DEVICE

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	Р9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

		apered	Element Osci	llating Microba	lance (TEOM	700,000,000	
			FLC	OW AUDIT		100 R00 Y14 (a)	an which f
	1						
	11				1 1	n /	
Date				Site Name	Burch	Beach	
Start	1610	PST		Operator	" Scott.	Weaver	
Finish	14:00	PST	- Washington and	Project	: SB270	ALCUNO V	-
	I RECEIVED	1		Site Elevation		ft	
			T	Amb. Press.	892.9	in. Hg	
				Amb. Temp.		deg. C	1
V. 1888					21.7	uog. o	
Prop. Or Ser. No.:	24982	-		Make	R&P		
Type:	PM10				1400a/ /		
		1197		Last Cal. Date:			
				1	6/7/4		
		Audit	Device(s)	1	-	-	<u> </u>
Make:	BGI INCOR	DODAT	ED	Make:	DCT THEO	DDODETTO	
Model:	DELTA CAL	LUKAL	γν	Model:	LUCK THE THE	KPUKATED	
S/N:		15		S/N:	LILL IN WAI		
Range:	Market O				-U-L-U		
Calibration factors:	2 - 20	datt	C-171	Range:	2 - 20	Ipm	
Slope:			Calib	ration factors:			
Int.:	1.0		<del> </del>	Slope:	1.0		
Cal Date:	0,0			Int.:	0.0-		
vai Date:	4.4/1			Cal Date:		f	
	D T ID -1/2			L			
Q <sub>a</sub> =m[d	PxT <sub>e</sub> /P <sub>e</sub> J <sup>1/2</sup> +b		Altitude Corn	ection Factor:	-1013		1.
					4-5-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4		
Leak Check-Initial	Main:	.08	Aux:	113			
Leak Check-Final	Main:		Aux:	7-2			
			Site		Nominal F	low Rates	
Audit	Audit Flow I		Flow Rate	Diff.	Lower Limit	Upper Limit	
Point	delta P	VLPM)	(VLPM)	(%)	(LPM)	(LPM)	
Total Fow Rate	17.39/		2.99/13	65 = 16.	4 15.0	18.4	
Aux. Flow Rate	14/9		13.45	J. P.		- 30.7	
Main Flow Rate	3.09		299		2.7	3.3	
Total Flow Rate	17.24		76.64		15.0	18.4	
	/						
			Stand	dard			
	Sampler		True	Raw	·····		
Amb Temp	28.5			19 4			
Amb Press	474		890.43	8910			
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Comments:					10,100		
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			7				

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

### MEMORANDUM

DATE:

April 11, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, North Beach, April 11, 2011," for your review. Please refer any comments you may have on the document to me by June 13, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

# SITE: NORTH BEACH

Report Date: April 11, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at North Beach was audited on April 4, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

### 2.0 Parameters Audited:

T.E.O.M. PM-10

### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

# Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) $AUD\Gamma\Gamma$

Date of report:	4/11/11					
Date:	4/4/11			Site name: 1	North Beach	
Start:	14:10hrs. PST	T.		Operator: S	Scott Weaver	
Finish:	14:25hrs. PST	7		Project: S	SB 270	
Audited By:	Mike Horn			Site Elevation:	3600	ft.
Witness:	Scott Weaver			Amb. Pres.:	896.60	hPa
				Amb. Temp.:	21.3	deg. C
Prop. or Serial No.:	24983			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	3/17/11	
	AUDIT	DEVICE(S)				
Make:	BGI Incorporated			Make: I	GI Incorporated	
Model:	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lpm	1		Range:	2 - 20	lpm
	Calibration Factors				Calibration Factor	'S
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.070	0.120	20.5	-0.8	893.47	-3.1
Dark current:	N/A	N/A				
	$Qa = [dPxTa/Pa]^{1/2} + b$		Site		Nominal	Flow Rates
Audit	Audit Flow	Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	* *
Total Flow Rate	17.29	 17.29	16.64	-3.8	15.0	18.4
Bypass/Aux Flow Rate	14.24	14.24	13.65	-4.1		
Main Flow Rate	3.07	3.07	2.99	-2.6	2.7	3.3
<b>Total Flow Rate</b>	16.31	16.31	16.64	2.0	15.0	18.4

Comments: None.

### TABLE A-1

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	ent Variable	Evaluation Criteria
Wind Speed	1	At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direc	tion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	re	input $\pm$ 0.5° C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	n	input $\pm 10\%$
Barometric	Pressure	Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury
PM-10: Hi- PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

### Appendix B

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	Р9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0,6

		apered	Element Osci	llating Microb	alance (TEOM	)		
			FLC	TIDUA WO		· 15 touthouses	90 POROL 100	
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Finish	1 1 - 1 -	PST		Operator		Meany		
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		-						<b>-</b>
Audit			Site		Nominal F	low Rates		!
Audit Point	Audit Flow		Flow Rate	Diff.	Lower Limit	Upper Limit		İ
	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		
Total Fow Rate	11.27		2.99/13	25=16-6	4 15.0	18.4		
Aux. Flow Rate	14.24		13.65		4			
Main Flow Rate	3.01		2,99		2.7	3.3		
Total Flow Rate	16.31		16:64		15.0	18.4		
			Stand					
	Sampler		True	Raw				
Amb Temp	20,5	740		21.3				
Amb Press	. 887		893.47	8966				
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***								
Comments:	SHARE SHIPS THE SAME OF SHIPS				7/4			
						*****		
2						1		

### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

### MEMORANDUM

DATE:

January 19, 2011

TO:

Chris Lanane, Scott Weaver

FROM:

Mike Horn /////

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, North Beach, January 19, 2011," for your review. Please refer any comments you may have on the document to me by March 21, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

# SITE: NORTH BEACH

Report Date: January 19, 2011 Prepared by: Mike S. Horn

### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at North Beach was audited on January 18, 2011. The audit was conducted by Mike Horn and was witnessed by Scott Weaver, who is the site operator.

### 2.0 Parameters Audited:

### T.E.O.M. PM-10

### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

## Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	1/19/11						
Date:	1/18/11			Site name:	North Beach		
Start:	14:50hrs. PS	Γ		Operator:	Scott Weaver		
Finish:	15:00hrs. PS	Γ		Project: 1			
Audited By:	Mike Horn			Site Elevation:	3600	ft.	
Witness:	Scott Weaver			Amb. Pres.:	893.20	hPa	
				Amb. Temp.:	18.2	deg. C	
Prop. or Serial No.:	24983			Make:	R & P	v	
Туре:	PM-10			Model:	1400ab		
				Last cal. date:	12/9/10		
	AUDI	Γ DEVICE(S)					
Make:	BGI Incorporated			Make: BGI Incorporated			
Model: DELTA CAL				Model: DELTA CAL			
S/N:	525			S/N:	525		
Range:	2 - 20 lpn	ı		Range:	2 - 20	lpm	
	Calibration Factors				Calibration Factor	'S	
Slope:	1.00			Slope:	1.00		
Intercept:	0.00			Intercept:	0.00		
Cal date:	1/4/11			Cal Date:	1/4/11		
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.	
Leak check:	0.070	0.120	17.7	-0.5	890.43	-2.8	
Dark current:	N/A	N/A					
$Qa = [dPxTa/Pa]^{1/2} + b$			Site		Nominal	Flow Rates	
Audit	Audit Flow Rate,		Flow Rate	Diff.	Lower Limit	Upper Limit	
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)	
Total Flow Rate	17.26	17.26	16.64	-3.6	15.0	18.4	
Bypass/Aux Flow Rate	14.15	14.15	13.65	-3.5			
Main Flow Rate	3.06	3.06	2.99	-2.3	2.7	3.3	
Total Flow Rate	17.24	17.24	16.64	-3.5	15.0	18.4	

Comments: None.

### TABLE A-1

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	nt Variable	Evaluation Criteria				
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H				
Wind Direct	ion	input $\pm$ 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor				
Temperature		input $\pm$ 0.5° C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers				
Relative Humidity		Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew poir Gravimetry Lab: input $\pm$ 5%				
Precipitation		input ± 10%				
Barometric Pressure		Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury				
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%				
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%				

Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

Leak Check

TEOM:

## Appendix B

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	12/22/09	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	Р9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		

Date:			Tapered	Basin Unified A Element Osci	llating Microb	alance (TEOM			
Start	7-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1			FLO	OW AUDIT		***********	120 5000 10	9 = 9
Start								1"	
Start						1		1	
Finish:					Site Name	: nent	Blue	1	-
Prop. Or Ser. No.:					Operator	r: Jett m			
Amb. Press.   37 3    n. Hig	Finish	19:00	PST		Project	t: SB270	BOANS -	<del> </del>	
Amb. Tremp.   3, 2   deg. C					Site Elevation	1:	ft	+	- +
Amb, Temp.:   S.					Amb. Press.	8932	in. Ha		
Prop. Or Ser. No.:   74 9 7 2			4		Amb. Temp.	187			7.5
Type:   PM10						100			
Last Cal. Date:   12   1/4	Prop. Or Ser. No.:	2498	21		Make	: R&P			-
Audit Device(s)   Make: BGI INCORPORATED   Model: BELTA CAL   Model: DELTA CAL   Model: DELTA CAL   SIN: 0123   SIN: 0123   Calibration factors:   Calibration	Type:	PM10			Model	: 1400a			
Audit Device(s)   Make: BGI INCORPORATED   Model: BELTA CAL   Model: DELTA CAL   Model: DELTA CAL   SNI: 0423-525   SNI: 042					Last Cal. Date	: 12/9/11	ļ		+
Make   RGI INCORPORATED   Make   Model:   DELTA CAL						12/1/10	1	<del> </del>	-
Make   RGI INCORPORATED   Make   Model:   DELTA CAL			Audit	Device(s)		1			-
Model:   DELTA CAL   Model:   SIN: 0123    Make:	BGI INCOM	DODAT		Make	RGT TNCO	DDODATED	i	-	
Calibration factors:  Slope: 1 . 0   Siope: 1 . 0   Int: 0 . 0    Cal Date:	Model:	DELTA CAL		1		- MALLANDY MI	NUMBER		
Calibration factors:  Slope: 1 . 0   Siope: 1 . 0   Int: 0 . 0    Cal Date:	S/N:	0123 5	25			ULLIA LA	1		-
Calibration factors:   Slope: 1	range:	2 - 20	Ipm			ULCO	Inm		-
Slope:   1.0	Calibration factors:			Calib	ration factors:	2 - 20	-pin		
Int.	Slope:	1.0	1	1					-
Cal Date:	Int.:			1		1.00			
Comments:		1/11/1	1		the same of the sa	0.0			
Leak Check-Initial   Main:		14.41	1	·	Jui Dute.			*****	
Leak Check-Initial   Main:	Q,=mfc	PxT_/P.11/2+b		Altitude Corn	action Factors	. 1017			
Leak Check-Final   Main:				Adda Com	ection ractor.	- 1013			
Leak Check-Final   Main:	Leak Check-Initial	Main:	27						
Audit			00/		1/2				
Audit Flow Rate   Flow Rate   Diff.   Lower Limit   Upper Limit				Aux.					
Audit Flow Rate   Flow Rate   Diff.   Lower Limit   Upper Limit				Cito					
Point delta P (VLPM) (VLPM) (%) (LPM) (LPM)  Total Fow Rate   7 / 2   7 / 9 / 15.0   18.4    Aux. Flow Rate   3 / 2   2 / 7   2.7   3.3    Total Flow Rate   7 / 2   15.0   18.4    Main Flow Rate   7 / 2   16.4   15.0   18.4    Sampler   Standard   True   Raw    Amb Temp   7 / 7   8 / 9 / 3 / 2    Amb Press   \$ / 7   8 / 9 / 3 / 2    Comments:	Audit	Audit Flow	Pate		Diff				
Total Fow Rate						Lower Limit			
Aux. Flow Rate		12 27	( arr mi)	T CC //2					
Main Flow Rate 3 0 6 2 . 9 2.7 3.3 Total Flow Rate 17 . 24 16 6 4 15.0 18.4 Standard Sampler True Raw Amb Temp 77.7		11/1/2		2.97/13	65 = 16.4	4 15.0	18.4		
Total Flow Rate 17.24 15.0 18.4 15.0 18.4 15.0 18.4		19.15		13.65					
Standard   Sampler   True   Raw   Amb Temp   7,7   8,7   8,7   7,7   8,7   7	*	3.06		2.79					
Sampler   True   Raw	Total Flow Nate	11.24		16.64		15.0	18.4		
Sampler   True   Raw				1					1
Amb Temp   7.7   890.43   893.2    Comments:		- C1		Stand					
Amb Press 879 890.43 893.2  Comments:	Amb Tome	Jampier		True			"		
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